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COMBUSTION AIR SUPPLY SYSTEM

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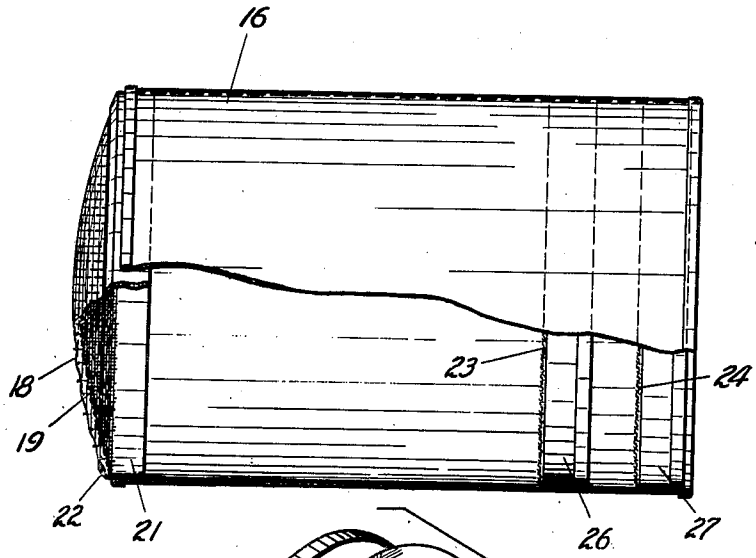


Fig. 2

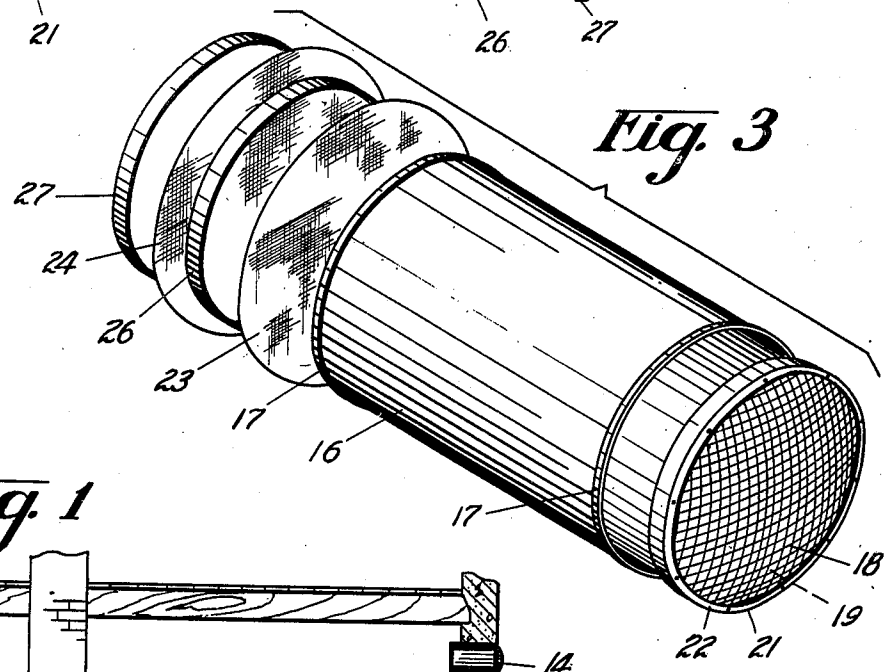
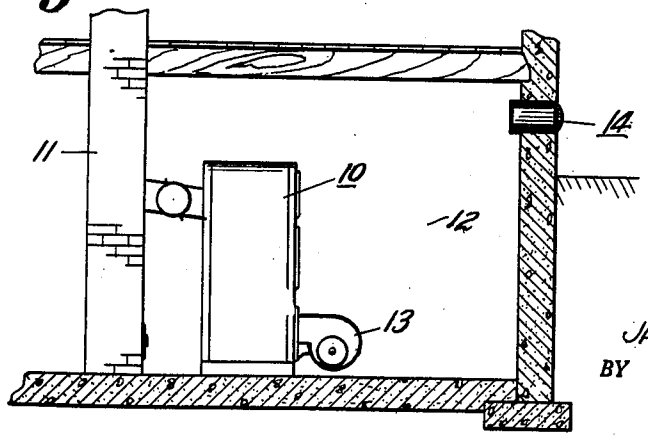


Fig. 3

Fig. 1



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COMBUSTION AIR SUPPLY SYSTEM

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2 Claims. (Cl. 98—118)

This invention relates to a means for and a method of supplying fresh air to a closed space in which a heating plant or the like, requiring air for combustion, is operated and particularly a heating plant using a forced firing system.

Automatic firing systems, particularly those using a forced air supply, require relatively large quantities of air during short periods for proper combustion. The demand for this air occurs periodically rather than at a continuous fixed rate and, therefore, less time is allowed for infiltration in the normal manner—that is, through window cracks and the like. It is necessary that the supply of air for combustion be practically constant since an insufficient supply of air will result in the establishment of a partial vacuum within the furnace room and this, of course, will result in a decrease of supply of air, consequent smoking, and generally insufficient combustion resulting in inefficient and expensive operation.

The insufficient supply of air may, of course, be "remedied" by opening a window, but this is a very unsatisfactory solution, especially in cold weather since it not only permits the entry of large quantities of cold air into the building, but dust and dirt, vermin, mice and the like as well.

The greatest objection to an open window or the like is to the free entry of large quantities of cold air to create drafts in the chimney and chilling of the basement walls, floor and ceiling, with a resulting higher rate of fuel consumption in the case of solid fuels, and lowered combustion efficiency in the case of gaseous fuels.

It is accordingly a primary object of my invention to provide a vent particularly well adapted for admitting an abundance of clean, fresh air into a furnace room or, in fact, into any enclosed space.

A further object of my invention is to provide a device of this nature which will eliminate objectionable room drafts and which will diffuse cold fresh air into the room air in such a manner as not to cause any increase in the normal chimney draft.

A further object of my invention is the provision of a simple, inexpensive vent of this nature utilizing simple, easily replaceable filtering medium.

Other and further features and objects of the invention will be more apparent to those skilled in the art upon a consideration of the accompanying drawing and following specification, wherein is disclosed a single exemplary embodiment of the invention, with the understanding, however, that such changes may be made therein as fall within the scope of the appended claims, without departing from the spirit of the invention.

In said drawing:

Figure 1 is a more or less schematic view of a furnace room showing, in particular, the method of installing a fresh air vent constructed in accordance with a preferred embodiment of my invention.

Figure 2 is a view in side elevation of the fresh air inlet or venting means shown in Figure 1, partly broken away to better illustrate the construction, and

Figure 3 is a view in perspective illustrating the various parts of the device shown in Figures 1 and 2 in exploded relation.

Referring now to the drawing and to Figure 1 thereof in particular; a heating plant, indicated generally at 10, has its smoke pipe connected to the chimney 11 and is located in a relatively airtight, basement furnace room 12. It is the usual practice to provide only a few small windows in a basement and this, of course, limits the infiltration of fresh air from this source to a quantity usually insufficient to properly supply air for combustion. Also, it is the usual practice to provide closely fitting doors between the furnace room and other parts of a building to prevent passage of dust and dirt. Consequently, the infiltration of fresh air from the other parts of the building is slow and ordinarily insufficient to supply the requirements of a forced draft firing device such as the oil burner indicated at 13, or stokers or the like.

I have, therefore, provided the fresh air intake and filtering device indicated generally at 14 and shown in detail in Figures 2 and 3. This device is preferably mounted permanently, as by cementing, into the masonry of the basement wall but may, of course, be mounted in a window opening.

A device constructed in accordance with a preferred embodiment of my invention includes a thimble 16 of rust resisting sheet metal or the like, and this thimble is preferably beaded or flanged, as shown at 17, in order to strengthen it.

A pair of screening members 18 and 19 are mounted in an annular sleeve member 21 also of sheet metal and adapted to be slidably mounted in the outer end of the thimble. The outer of the two screens 18 is of heavy gauge, coarse mesh "wire cloth" for protection and to exclude leaves, paper, and the like, as well as rodents and other animals.

The inner screen 19 is of considerably finer mesh to prevent the entry of small insects and

the like. These screen members are preferably bowed or bulged outwardly to strengthen them against blows, and are secured along their edges by welding or other means to a flanged or beaded portion 22 formed along the outermost edge of the annular sleeve 21. The outer screen may be of galvanized wire and the inner screen of copper or brass wire.

Replaceable filter members comprising disks of muslin, cheese-cloth or other similar material are installed in the inner end of the thimble. I prefer to use a pair of these filter cloths as shown at 23 and 24 and support them in place as shown in Figure 2 by means of ring members 26 and 27.

These ring members may be of sheet metal beaded along one or both edges for reinforcement and of such diameter as to be firmly supported in place when they are pressed into the thimble with the edges of the filter cloths therebetween.

These filter members filter out substantially all of the air-borne dust and may, of course, be replaced quickly and at negligible cost. One of the major results attained by their use, however, is in the diffusion of the entering air. These filter elements have just sufficient resistance to the free flow of air, that a very slight but relatively constant vacuum may be set up within the furnace by the exhaust blower unit or by the chimney draft, and the cold entering air will, therefore, tend to spread throughout the room rather than drop directly to the floor where it may stratify and thereby set up an increased draft in the chimney.

It will be apparent, now, that I have provided a simple, relatively inexpensive device for providing a supply of cleaned fresh air and one that eliminates the objectionable features of open windows, doors and the like.

A venting device, such as I have described, does not create objectionable drafts, and since it permits an adequate and constant supply of air for combustion of fuel in furnaces, it results in a saving of fuel when applied to relatively tight furnace rooms.

A device such as I have described is, of course, applicable to any room or part of a building for furnishing a supply of clean, fresh air.

Although I have described a specific embodiment of my invention, it is apparent that modifications thereof may be made by those skilled in the art. Such modifications may be made without departing from the spirit and scope of my invention as set forth in the appended claims.

I claim as my invention:

1. A fresh air inlet for a furnace room including a thimble, a sleeve snugly received in the outer end thereof, a pair of wire mesh screens fixedly mounted within the sleeve, the outer one of said screens being of relatively heavy gauge, coarse mesh material, the inner screen being of finer mesh, at least one removable fabric filter disposed within the thimble, spaced from the wire screens and removable from the inner end of the thimble, and means for supporting said fabric filter within the thimble comprising a sleeve slightly smaller than the inside circumference of the thimble adapted to wedge the fabric between the outer surface thereof and the inner surface of the thimble.

2. A fresh air inlet for a furnace room comprising a sheet metal thimble, a short sleeve slidably received in the outer end thereof, said sleeve being flanged inwardly at its outer end, a pair of disc-like and outwardly dished wire screen members secured against the inner side of the flanged portion of the sleeve, the outer of said screen members being of relatively heavy gauge and coarse mesh material as compared with the inner of said screens, a pair of fabric filter discs, and means for supporting said discs in spaced relation within the inner end of the thimble, said means comprising sheet metal rings of a diameter slightly less than the internal diameter of the sleeve for wedging the filter discs against the inside of the thimble.

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